

# RISK ASSESSMENT NEPAL

## AFTER THE EARTHQUAKES IN APRIL AND MAY 2015

A DESK STUDY UNDERTAKEN BY THE SWISS NGO DISASTER RISK REDUCTION PLATFORM  
AUGUST 2015



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## 1. Executive Summary

The devastating earthquakes in April and May 2015 in Nepal have caused over 8'800 casualties and destroyed over 500'000 homes, thousands of classrooms and hundreds of health facilities. As the five Swiss NGOs CaCH, Helvetas, Solidar, SRC and TdH will implement recovery programmes during the next years, they have decided to mandate a common Risk Assessment in the form of a desk study completed by a one-week visit to the field.

Nepal experiences disasters each year. As a small country with a remarkable geographic diversity and climatic characteristics that vary from sub-tropical to alpine conditions Nepal is **prone to several classes of hazards** ranging from hydro-meteorological, geological, biological, industrial and accident related disasters. (Chapter 2 Hazards)

Virtually the entire population of Nepal is at risk of natural hazards and/or the effects of global warming and climate change. Besides heavy precipitations and tectonic activities, man-made factors such as **unregulated expansion of urban development** caused by demographic growth, as well as **environmental degradation** are the main reasons for high vulnerability. The linkage between poverty and vulnerability can be observed in a exemplary way in the case of the earthquakes in 2015 which will push into poverty **at least 700'000 additional people**. Given that 93% of houses in the rural area are non-engineered constructions the sector is especially vulnerable. (Chapter 3 Vulnerability)

Even almost 10 years after the peace agreement in 2006, Nepal remains in a period of political transition and legislative reform processes in disaster risk reduction (DRR) is very slow. A new **Disaster Management Act (DMA)** that would lay the base for an efficient institutional set-up has been drafted in 2011, but has still not been endorsed. The **absence of locally elected representatives** for over 15 years has hindered local planning processes, particularly the participation of local populations. (Chapter 4 Coping Capacities)

During the **transition phase between Emergency Relief and Reconstruction**, the Swiss NGOs are currently developing their Recovery Projects. The recovery and reconstruction phase is a critical opportunity to **Build Back Better** and thus contributing to an increased resilience of the communities and the country. (Chapter 5 Lessons Learned and Chapter 6 Recommendations)

## 2. Introduction

The Swiss NGO DRR Platform is a network of Swiss based non-governmental organisations (NGOs) dedicated to increasing the resilience of women, men and children, communities and governments to all aspects of disaster risk reduction (DRR) and climate change adaptation (CCA).

Its main goal is to support people and institutions prepare for and adapt to climatic trends and shocks, to more effectively mitigate risks and to enhance risk prevention in the humanitarian and development sectors. The Platform operates through ad-hoc working groups composed by its members, by enabling and supporting policy debate among state and non state actors in Switzerland, advocating for DRR and CCA in national and international exchange and by capturing and sharing knowledge and experiences relating to DRR and CCA of Swiss NGOs and their partners.

A working group composed by Caritas Switzerland, Swiss Red Cross and a free lance consultant worked over two years on the mandate of the Swiss NGO DRR Platform to come up with a set of qualitative and quantitative indicators at impact, outcome and output level that can be used by NGO practitioners.

## 3. Rationale for this publication

The five Swiss NGOs Caritas (CaCH), Helvetas, Solidar, Swiss Red Cross (SRC) and Terre des hommes (Tdh) have started in a first phase immediately after the earthquake to provide emergency relief to the affected population; in a second phase corrugated sheeting has been provided to families whose houses had lost their roofs. Temporary Learning Centres made of bamboo and corrugated iron, Temporary health posts and gender-segregated latrines were erected in dozens of VDCs.

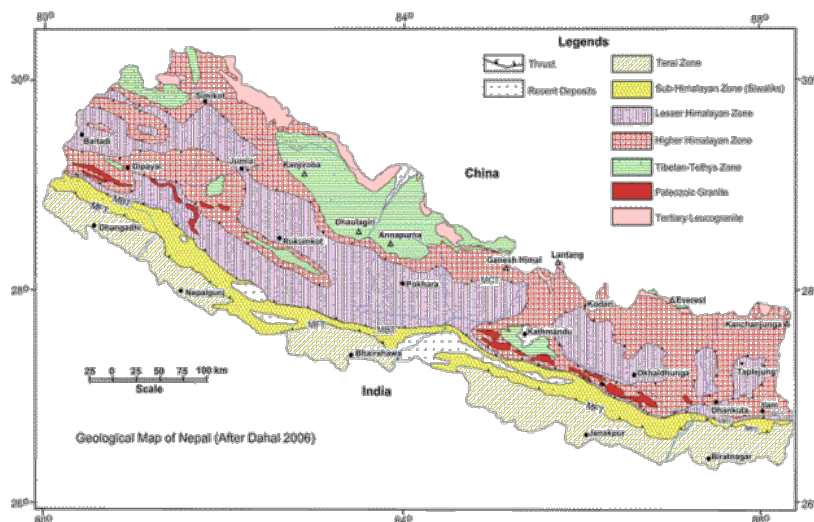
The Swiss Solidarity has collected 32 Mio. CHF in total to support the Swiss NGOs; out of this amount 7 Mio. or 20 % have been spent during the emergency relief phase and 25 Mio. will be allocated to recovery and rehabilitation projects.

While the recovery project of CaCH will concentrate on the Education sector (Construction of 50 permanent schools), TdH and partly SRC will focus on the Health sector, Solidar on Housing and Helvetas on WASH. SRC will work with an integrated approach Shelter/Health/WASH/ Livelihood. In addition, based on good practice in Build Back Better gained in other countries Helvetas and Solidar, as well as SRC will be engaged in capacity building for masons and homeowners.

The structured literature review will help the Swiss NGO's working in Nepal in accessing through a concise report relevant information sources and inform them on structural set up and policies in Nepal, as well as existing flagship projects in DRR in Nepal. This information will help NGO to link their interventions to key approaches to reduce risk and thus enhance their effectiveness.

Last but not least the report aims to promote DRR mainstreaming in recovery phase and support advocacy for increased attention to a risk informed development and recovery.





#### 4. Relevant current and future natural Hazards

(Main sources: Nepal Hazard Risk Assessment; NSDRM Nepal, Wikipedia: Geography of Nepal)

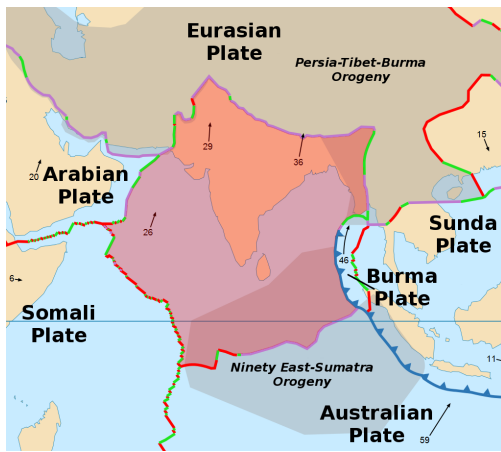
Nepal as a land-locked country with a total area of 147'181 km<sup>2</sup> is situated in the central part of the Himalayas, divided into three belts along a south-to- north transect: Terai, Hill and Mountain Regions. For a small country, Nepal has a remarkable geographic diversity. It rises from as low as 59 metres elevation in the tropical Terai beyond the perpetual snow line to some 90 peaks over 7,000 metres including earth's highest 8,848 metres Mount Everest. Each of these areas has a distinct altitude and climatic characteristics that vary from sub-tropical to alpine conditions. Average annual precipitation varies from as little as 160 millimetres in the rain shadow north of the Himalaya to as much as 5,500 millimetres on windward slopes. The country has more than 6'000 rivers that largely drain north to south. The three major river systems are *Koshi*, *Gandaki/Narayani* and *Karnali*, all tributaries of the Ganges. (Wiki)

Nepal experiences disasters each year. The country is prone to several classes of hazards ranging from hydro-meteorological, geological, biological, industrial and accident related disasters. Flood, landslide and health hazards are a consistent threat to human life in Nepal killing about 750 people every year significantly contributing to loss of livestock and economic losses. The climate change has accelerated the frequency of hazards occurrence. In addition, as the earthquakes in April and May 2015 recalled, Nepal has a long history of earthquake activities due to its location on a tectonic active zone. The Bureau of Crisis Prevention and Recovery at UNDP BCPR ranks Nepal as the eleventh most at-risk country for earthquakes and the thirtieth most at-risk for floods. The five hazards with greatest impact are earthquakes, floods, drought, landslides and epidemics.

##### Earthquakes

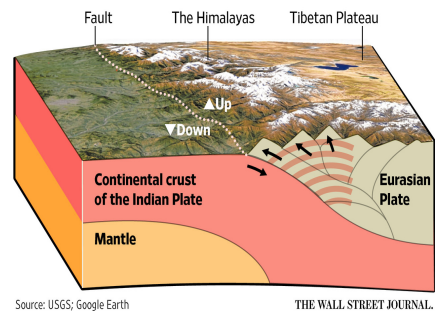
Due to its location on a tectonic active zone Nepal has a long history of earthquake activities of smaller and greater magnitude. As a result of the Indian plate moving north 2 cm/year under the Eurasian Plate, there are three main fault lines running east to west (ICIMOD, 2007): the main thrust (MCT) at the foot of the greater Himalaya joining the midland mountains, the main boundary fault (MBF) at the junction of the lesser Himalaya, and the Siwalik and the Himalaya frontal Fault south of the Siwalik. The seismic zoning map of Nepal divides the country into three zones extended in northwest- southeast direction; in the middle part of the country the risk is slightly higher than the northern and the southern parts. The flat plains of Terai in the south of the country are disposed to liquefaction while the middle hills and the higher mountains are prone to earthquake-induced landslides. (NSDRM)

Ever since the first recorded earthquake of 1255 AD that killed one-third of the population of the Kathmandu Valley and its king, Abhaya Malla, Nepal has experienced a major earthquake every few generations. (1810, 1866) The last big historical earthquake in 1934 (magnitude 8.4) resulted- depending on the source- in 9'000 to 10'000 deaths in the Kathmandu valley. Earthquakes of smaller magnitude in 1980, 1988 and 2011 also caused severe human and physical loss.



### Continental Collision

As the Indian subcontinent pushes against Eurasia, pressure is released in the form of earthquakes. The constant crashing of the two plates forms the Himalayan mountain range.



Source: USGS; Google Earth

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After over 80 years without a natural shock of comparable magnitude, an earthquake of 7.6 magnitude with the epicentre in Barpak in the historic district of Gorkha, about 76 km northwest of Kathmandu, hit Nepal on Saturday, 25 April 2015 at 11:56 local time, as recorded by Nepal's National Seismological Centre (NSC). The earthquake was followed by a series of aftershocks greater than magnitude 4.0, out of which the strongest with a magnitude 7.3 occurred on 12 May in Dolakha.

However, according to a 30 July publication, the April and May earthquakes did not release the accumulated stress on the fault edges, although as a result, the Kathmandu bedrock shifted 1.3 m south and upwards by 50 cm. If the unruptured region ruptures in a single earthquake it could exceed Magnitude 8; thus the 2015 earthquake was not yet the great earthquake anticipated west of Kathmandu.

### Riverine and Flash Floods

Besides earthquakes with a long return period **floods** are the most recurring hazards and the greatest cause of economic losses in Nepal. According to DesInventar data floods caused damages in the total amount of close to 6 billions USD and accounted for 37% of the destroyed houses, and 11% of the casualties (3'329 persons) caused by manmade and natural disasters over the 40-years period from 1971 to 2011. During the four months of monsoon from June to September characterized by intense rainfall, rivers, originating from the Mahabharat range (Kankai, Kamal, Bangmati, West Rapti and Babai) cause inundations of large areas in the flat plains of the Terai resulting in extensive damage to life and properties. The problem is further exacerbated by huge depositions of debris in the riverbed and by the construction of embankments across the river flows, especially just across the international border with India.

While riverine floods from the major perennial rivers generally rise slowly in the southern Terai plains, **flash floods** are characterized by little time lapse between the start of the flood and peak discharge. Flash floods in the rivers in the Siwalik range in southern Nepal are dangerous because of the suddenness and high flow velocities with which they occur. Flash floods can be triggered by extreme rainfall, glacial lake outbursts, or the failure of dams- whether man-made or caused by landslides, debris, ice or snow. Damming of a river by a landslide that will eventually collapse is a potentially dangerous situation. Such a blockage of the river flow is more common in narrow valleys where the slopes are steep on both sides of the river.

Glacial lakes are common in the high altitude areas of the country; 2'315 glacial lakes have been identified in Nepal. These lakes often containing a huge volume of water are dammed behind moraine ridges which are stable depending on the amount of ice within; an unstable condition may lead to a breakage of the natural dam, creating a **Glacial Lake Outburst Flood (GLOF)** with the potential to cause great damage downstream. During the last 450 years 14 GLOFs have occurred in Nepal itself and another 10 across the China-Nepal border (ICIMOD, 2011); in total, 20 glacial lakes have been identified as being potentially dangerous at present. (NHRA)

## Drought

Some studies of past drought suggest that unusual events were randomly found in the country's historical records. However, the fact that Western Nepal has experienced consecutive and rapidly worsening winter drought conditions since 2000, indicates that these are linked to global warming and resulting climatic changes. The change of rainfall pattern was culminating in the severe 2008/2009 winter drought - one of the worst in the country's history - when crops were destroyed across Nepal, with wheat and barley production reduced by 14 and 17 percent respectively. Some studies show that there is less rain over eastern and central Nepal during El Nino- years.

For agriculture production it is important to study the probability of having a consecutive dry period during the growing season of a crop, early warning and drought monitoring system in Nepal is therefore urgently needed.

## Landslides (earthquake/ rainfall triggered)

The middle hills and the higher mountains of Nepal are highly susceptible to rainfall and earthquake triggered landslides, as well as to debris slides and flows, excessive erosion on hill slopes and rock falls. According DesInventar, landslides are responsible for 15% of the casualties (4'476 during the 40-year period) and caused damages in the amount of over 25 Mio. USD/ year (over 1 billion USD during the whole period). After the 2015 Earthquakes in the worst hit areas, entire settlements, including popular tourist destinations like Langtang village, were swept away by landslides and avalanches triggered by the earthquakes. Due to the weakened, ruptured, and destabilized slopes and surfaces, during the following monsoon period, the vulnerable areas have become even more susceptible to flooding and. (PDNA)

Slope gradients, lithology especially the capability of soils to retain moisture which is influenced by the vegetation cover are **controlling factors** for landslide hazard, while earthquake and precipitation are **triggering factors**. Rainfall triggered landslides, usually correlate with peak of monsoon. Besides heavy precipitations and tectonic activities, man-made factors such as uncontrolled and unsafe development, as well as environmental degradation are the main reasons for landslides. In view of population growth and rapid development in hills and mountains in the country, it has become imperative to review, identify and analyse landslide prone areas and understand the underlying factors. There is a need for **upgrading the existing land use and land cover maps** and developing **soil maps at national and local scale**, as well as of **continuous rainfall monitoring**.

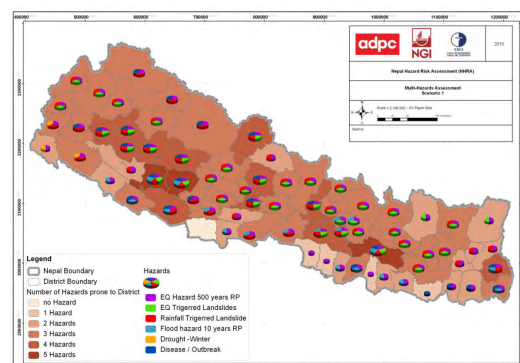
## Epidemics

Nepal is prone to a wide range of outbreaks and diseases such as Diarrhoea, Kalazaar, Chickenpox, Hepatitis, Influenza, Typhoid, Acute Respiratory Infection, Malaria, Sexual Transmitted Infection, Tuberculosis, and Leprosy. Data are available from various sources, e.g. the Annual Reports of the Department of Health Service (2013). In accordance to the data compiled by DesInventar for more than four decades epidemics accounted for 415 casualties per year, with 59% thus presenting the most common cause for deaths. The root cause for water and vector bond diseases are closely connected to existing socio-economic condition, hygiene and health infrastructure; there is also an interlinkage of these diseases with floods and other hydro-meteorological conditions. This is also the case this year, with confirmed cases of cholera in the Kathmandu valley, and salmonella and typhoid in Sindhupalchowk in July and early August. (NEAU)

Figure:

Example of a Multi-hazard map based on the following Scenario (Source: NHRA):

- Earthquake of 500 year return period
- Earthquake induced landslide
- Rainfall induced landslides
- Floods of 10 years return period
- Drought in winter and Health hazards susceptibility.



<b>Risk</b>	The combination of the probability of an event and its negative consequences. (UN-ISDR 2009) <i>Possible formula: Risk= (Hazard x Exposure x Vulnerability)</i>
<b>Hazard</b>	A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. (UN-ISDR 2009)
<b>Exposure</b>	People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses. (UN-ISDR 2009) <i>Exposure is the total value of elements at risk. It is expressed as the number of human lives and the value of the properties or assets that can potentially be affected by hazards. Exposure is a function of the geographic location of the elements at risk</i>
<b>Vulnerability</b>	The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. (UN-ISDR 2009) <i>Vulnerability is a function of the existing hazards and the characteristics and quality of resources or population exposed to those effects. Vulnerability can be estimated for individual structures, for specific sectors or for selected geographic areas, e.g. areas with the greatest development potential or already developed areas in hazardous zones.</i>

## 5. Determinants of Vulnerability to Natural Disasters in Nepal

### Exposure

Virtually the entire population of Nepal is at risk of natural hazards and/or the effects of global warming and climate change. However, specific subgroups have been identified as particularly vulnerable to the impact of natural hazards, either to a recurring extensive i.e. regularly occurring localized disaster that keeps them trapped in poverty and food insecurity or an intensive, i.e. irregular large-scale event, with the probable consequence of eroding the groups' development gains.

Part 2 of the Nepal Hazard Risk Assessment includes a detailed study of the **exposure, vulnerability and risk assessment** originating from the **different kinds of hazards**. Taking into account the interlinkage between the type of hazard and the sectors affected the following situations have been assessed:

- Impact of **earthquakes** of a defined magnitude on population, housing, education, health, industry, transportation and power sectors.
- Impact of **floods** on agriculture, housing, population, education, health and transportation sectors.
- Impact of **droughts** on the agriculture sector (depending on the type of crop (wheat, barley, paddy and maize), the season of the drought (pre-monsoon, post-monsoon and winter) and the region of the country) (ADPC/NGI/CECI 2009 p. 19-90).

### Demographic growth, rural-urban migration

There is an important demographic growth in Nepal; with a median age of 20.7 years its population is very young and has almost tripled within fifty years. While the population amounted to 10 Mio. people in 1960, today it is estimated to be around 28 Mio. people based on the 2011 census, with a population growth rate of 1.596%. 61% of the population is between 15 and 64 years old, 34.6% is younger than 14 years and only 4.4% more than 65 old. (Source: Wikipedia: Demographics of Nepal)

A related effect of population growth is the rapid and **unregulated expansion of urban development in Nepal**, which has led to greater risk for certain communities, particularly in relation to earthquake. **Kathmandu is one of the fastest growing cities** in South Asia, with a population of around 2.5 million people. It is situated on a major fault line, placing it at significant risk of an intense earthquake. Out of 21 cities worldwide that lie in similar seismic hazard zones, Kathmandu is at the highest risk in terms of impact on people. Moreover, rapid, chaotic urban development including non-compliance with the building code, failure to use qualified engineers or trained masons, encroachment of buildings on open space and depletion of the water table is increasing exposure and vulnerability at a significant rate. Kathmandu's critical infrastructure and essential services are also extremely vulnerable.

As the earthquake of 25 April 2015 has demonstrated in the event of a major earthquake, the presence of only three access roads into the Kathmandu Valley and lack of heavy equipment to remove rubble are serious barriers to an effective large-scale response. Studies indicate that if an 8.3 magnitude earthquake hit Kathmandu, more than 100,000 people could be killed, 300,000 injured and 1.8 million displaced. Fortunately the **time and day** the first earthquake occurred **saved thousands of lives**. Being a **Saturday**,

the weekly holiday, schools were closed. The death toll of young people could have been much higher considering that nearly 7,000 schools were completely or significantly damaged. Similarly, if the earthquake had struck at night, and not in the middle of the day, there would certainly have been greater casualties. (PDNA)

According to a study conducted in 2008 there are 40 **slum/squatter settlements** (referred to as sukumbasi in Nepal) in the Kathmandu valley, with 2’750 HH. Lack of economic opportunities in rural areas as is the main underlying cause for migration to urban areas. 24 out of the 40 squatter settlements are on the floodplain of rivers. Most of the remaining settlements are in areas prone to landslides. Most of these settlements are inhabited by indigenous groups, with Tamangs being the largest number, or disadvantaged groups (casts) such as Khadgi (butchers) and Podes (sweepers).

Socially discriminated groups such as **Dalits** are also in a weakened position to access public services following natural disasters. The impact of disasters differs too **between men and women** in terms of access to services, workload, decision-making power, financial status, and roles and responsibilities. In **rural areas**, the growing population and resulting reduction in the average size of landholding make marginal subsistence farmers increasingly vulnerable to drought and erratic weather conditions.

### Socio-economic factors

Mutual causal inter-linkages between poverty and vulnerability to natural hazards are broadly recognized. Recurring disasters can result in poverty trap when household assets and livelihoods are destroyed or lost. Even though Nepal has received continuous development assistance for over 60 years; it still ranks as an LDC (Least Developed Country).

The economic impact of a disaster and the linkage between poverty and vulnerability can be observed in a exemplary way in the case of the earthquakes in 2015: According to World Bank simulations, the earthquakes will push into poverty an additional 2.5- 3.5 percent Nepalis which translates into **at least 700’000 additional poor**, on top of the existing 25.2 percent living below the poverty line. It is estimated that the total value of disaster effects caused by the earthquakes 2015 is the equivalent of USD 7 billion; as a direct impact the annual economic growth in FY 2014-2015 is expected to be the lowest in eight years, at 3 percent, instead of 4.6 % as estimated.

The most affected sectors were the social sectors (58%, out of which 86% housing sector), productive sectors (25%) and infrastructure (10 %). The **private sector** has **sustained about 3.3 times** the value of **damages and losses** of the **public sector**. As stated by the PDNA, an disaggregated analysis of the **Per Capita Disaster Effects** (including damages and losses) per affected district, in **combination with the HDI** revealed that the average values range from a high of NPR 255,860 per person in Dolakha to NPR 43,800 in Makawanpur (see Table below). Preliminary assessment of incidence and impact suggest that the earthquakes have disproportionally affected the poorer, rural locations relative to the urban and less poor areas.

Per Capita Effects and Pre-Disaster HDI (PDNA Team/ UNDP)

District	Per capita Disaster Effects, NPR/person	HDI
Dolakha	255,860	0.459
Sindhupalchowk	233,370	0.455
Gorkha	209,080	0.481
Nuwakot	204,930	0.466
Rasuwa	179,700	0.461
Dhading	149,580	0.461
Kavrepalanchowk	119,200	0.520
Ramechhap	112,740	0.468
Bhaktapur	78,770	0.573
Okhaldhunga	74,500	0.468
Sindhuli	57,865	0.440
Lalitpur	52,765	0.601
Kathmandu	49,495	0.632
Makawanpur	43,760	0.497



### Physical infrastructure/ Housing

The site selection of district and rural roads is often done without previous environmental impact assessment/ initial environmental examination and thus even contributing to landslides. Roads and bridges are often poorly designed and built, without including stabilization of slopes and use of bioengineering. The fact that they are not constructed to resist to extreme events such as earthquakes, landslides and floods, is also contributing to the vulnerability of communities regarding access.

As a result of the Earthquakes 2015 there was a substantial impact on Education and Health infrastructure. Data indicate that over **40% of schools and 50% of classrooms have been damaged or destroyed in the affected areas**. 36,000 classrooms have been destroyed while around 17,000 additional classrooms have been damaged. (Education Cluster 23/06/2015) **A total of 462 health facilities, the vast majority of which were public, were completely destroyed, while 765 were partially damaged.** (Of the destroyed facilities, 84% are in the 14 most affected districts) Gorkha, Sindhupalchowk and Nuwakot experienced the highest number of destroyed health facilities. (PDNA 10/06/2015).

It is common knowledge that building codes are ignored and poor quality of infrastructure is often as well associated with the lack of law enforcement going along with still widespread corruption. Allegedly the approval of design documents can be bought.

The most affected sector after the earthquake was housing, with **539,000 houses** destroyed and **162,000 damaged** within the 14 most affected districts. Given that 93% of houses in the rural area are non-engineered constructions the sector is especially vulnerable.

### Environment/ Climate Change

**Environmental degradation** has hugely contributed to increasing natural disaster occurrence in Nepal. (floods, landslides and droughts) **Deforestation** started in the 1930s, with a peak in the 1950s and 1960s; the effects of loose soil and reduced forest cover from past forestry activities are still being felt in frequent landslides and floods. Today around 25 % of Nepal's land area is covered with forest, compared with 40% in 1990; the total deforestation rate from 1990 to 2000 was 2,1% per year. Deforestation is driven by multiple processes. Despite of the availability of liquefied petroleum gas in urban areas, firewood still supplies 80% of Nepal's energy for heating and cooking. Harvesting construction timber and lopping branches for fodder for cattle are also deforestation/degradation drivers in all geographical zones.

Nepal as a largely agrarian economy is also highly sensitive to **changes climate** and natural resource availability. According to the **National Adaptation Plan of Action (NAPA)** climate change projections indicate significant warming, particularly at higher elevations, leading to reductions in snow and ice coverage; increased frequency of extreme events, including floods and droughts and overall increase in the precipitation during the wet season, with exception of the mid-hills where a decrease of rainfall and droughts are expected.

### Institutional capacity

The Government of Nepal has adopted a comprehensive National Strategy for Disaster Risk Management (NSDRM) in 2011, also including a concept for an efficient institutional DRM set-up. Due to the fact that the out-dated and response-driven the Calamity Act of 1982 is still in use and the endorsement of a new Disaster Management Act (DMA) is imminent since 2011 due to political reasons the institutional capacity for DRM is quite weak at all levels. (see Chapter 4) The reason of the reluctance to move the DRM agenda forward in Nepal seems to be a political problem, not a lack of resources or technical knowledge.

In addition, the absence of district and local elections over the last decade (since 2002) has weakened those levels of government from the perspective of formal community participation in DRR.

Burocracy and **corruption** are widespread within the government of Nepal. In the 2014 *Corruption Perception Index* published by *Transparency International* Nepal is ranked 126/175. The problem will also be challenging in view of the billions of external support that will be flowing into the country to rebuild Nepal after the earthquake.

## 6. Coping capacities/ main national and international stakeholders

(Sources: Nepal Hazard Risk Assessment, part II, p 110 ff; NSDRM Nepal; National HFA Progress Report 2013-15, April 2015; The Role of SAARC, Stacey White, 2015; Analysis of legislation related to disaster risk reduction in Nepal, 2011 )

### Policy and legal framework

**Global/Regional level:** Nepal is signatory to disaster management treaties such as the **Hyogo Framework for Action (HFA)**, the **Sendai Framework 2015-2030** respectively. Being a member of **SAARC** in principal it has also access to regional DRM arrangements, services and trans boundary coordination.

Some initiatives for trans-boundary coordination, mainly with India, exist in the field of flood management, e.g. limited mechanism for the Koshi and Gandak River where early warning information is disseminated to the stakeholders in Nepal and India regarding the flood level. Due to the absence of a comprehensive cross- government strategy/ **operation and cooperation framework** in case of disasters, coordination and planning for disaster across borders is restricted to project approach.

#### Gap:

- Absence of a comprehensive **cross- government strategy/ operation and cooperation framework** in case of major natural disasters, including the regulation of issues such as mobility across the border, hotline contact with authorities at all levels (National, Regional and District levels) for immediate communication.

**National level:** Nepal remains in a period of political transition following a decade of armed conflict (1996-2006), a peace settlement in 2006 and on-going negotiations by an interim legislature-parliament over a new Constitution approved by all parties. The immediate impact for disaster risk reduction (DRR) is that legislative reform processes have slowed and become less clear, as has the process for implementation of new policy.

The legal framework for disaster management has a long history in Nepal with the **Natural Calamity (Relief) Act 2039 in 1982**. The act allocated the responsibility for preparing and responding to disasters to the Government and provided for an administrative structure for disaster management in the country. However, it is clearly response-driven and thus not an appropriate base for the shift from disaster rescue and response to disaster management and didn't provide any instrument for the mainstreaming of DRM into development sectors. Apparently various versions of a new **Disaster Management Act (DMA)** have been drafted, but none of them has yet been endorsed. The most recent draft DMA is scheduled for review by the Parliament sometime in 2015.

In an effort to fill the gaps left by the Calamity Act, the Government of Nepal and UNDP have developed in 2008 with the support of NSET the **National Strategy for Disaster Risk Management (NSDRM)**, (approved in 2011). The NSDRM provides more detailed, sector specific guidance for disaster management structures and planning at the various levels of government. (See Annex 4)

**Building regulation and earthquake risks:** The National Building Codes established under the Building Act in 1993 so far been only partially implemented by a small number of municipalities, meaning that high-risk buildings continue to be constructed, including in the heavily populated and seismically active Kathmandu Valley. No municipality has yet managed to implement the full cycle of building regulation by establishing (1) prior approval, (2) inspection and (3) enforcement/penalties. Reportedly the MoUD has drafted a new Building National Plan of Action to replace the Building Act.

The Department of Urban Development and Building Construction (DUDBC) of the Ministry of Physical Planning and Works (MoPPW) with NSET and UNDP/ERRRP has developed, distributed and provided training on the **Mandatory Rules of Thumb (MRT)**, a set of voluntary guidelines in the National Building Codes intended for owner builders to construct earthquake and fire safe smaller buildings. The MRTs, pragmatically, recognize that, especially in rural areas, most owner builders do not generally have access to engineering advice as 93 percent of buildings are non-engineered, and also stress that local materials should be used.

**Land use planning** is not clearly regulated and institutional responsibility for it is divided between the MoPPW and Municipal authorities, among others. New urban developments may occur without approval and the prior reservation of government land for roads, infrastructure and public open space for

evacuation, to reduce the earthquake hazard from falling buildings. As a reaction, the MoPPW is implementing a system of voluntary '**land pooling**' in the Kathmandu Valley. There is no consistent legal mechanism to relocate individuals or communities from high-risk land, especially flood plains. **Land use mapping** in all districts of the country is expected to be completed in five years. This will also have an impact on the allocation of land for house construction, settlements and scatter relocations in the aftermath of the earthquake.

**Gaps:**

- Endorsement of the last draft of a new Disaster Management Act pending
- Building Codes under the Building Act of 1993 to be replaced by a Building National Plan of Action drafted by MoUD that includes state-of-art Earthquake Safety regulations
- Implementation of the full cycle of building regulation at municipal level by establishing (1) prior approval, (2) inspection and (3) enforcement/penalties.
- Land use planning and Mapping in all districts of the country, including a consistent legal mechanism to relocate individuals or communities from high-risk land

### **Institutional set up at national and local level**

**National level:** Without a strong enabling environment for DRM, the Government of Nepal has never adopted an updated National Disaster Act or established a National Disaster Management Authority (NDMA). Institutionally, a relatively new DRM division is housed within the **Ministry of Home Affairs (MoHA)**. MoHA is also the Secretariat of the **Central Natural Disaster Relief Committee (CNDRC)**, a high-level multi-ministerial committee (27-member apex body) that is currently mandated by the NSDRM to address natural disasters. The CNDRC is authorized to formulate national policy regarding programmes for preparedness, response, and recovery. It is also charged with mobilizing the Central Disaster Relief Fund. At regional and district levels, the current institutional DRM structure envisions the establishment of **Regional and District Disaster Relief Committees (RDRCs/ DDRCs)**. (see annex 5)

According to the draft Disaster Act currently in circulation would the CNDRC would be replaced by a **Disaster Management Council headed by the Prime Minister**. The Council would be comprised of three different committees: [i] Disaster Risk Reduction; [ii] Preparedness and Response; and [iii] Recovery. These committees would be responsible for offering directives to an operational Executive Committee that would run a Disaster Management Centre under the Ministry of Home Affairs.

In addition to the MoHA, due to the acute risk of landslides, flooding, and earthquakes in the country the **Ministry of Urban Development in Nepal (MoUD)** is involved in DRR. The **MoUD** is made up of the Department of Water Supply and the **Department of Urban Development and Building Construction (DUDBC)**. The **DUDBC** has been instrumental in earthquake resistance and seismic retrofitting efforts. It has also spearheaded the drafting of a new **Building National Plan of Action** with the support of JICA and a special task force that includes DFID, UNDP, JICA, and NSET. Once adopted, the new National Plan of Action will replace the current building code dating back to 1993.

In addition to the Government of Nepal's civilian engagement in DRM, a Disaster Directorate has recently been established within the **Ministry of Defence** and **three additional armed forces** are mandated to engage in DRM activities: The **Armed Police Force**, created during the civil conflict, is very well resourced and even has a training centre for DRM exercises. The second is the **Nepal Army**. Some 100,000 Nepalese Armed Forces were deployed after the earthquake throughout the country. Third, the **Nepalese Police** are involved in DRM at local levels. However, at the time of the 2015 earthquake, no Standard Operating Procedures (SOP) was in place to govern civil-military relations for response.

In the absence of real government progress on DRM over the last decade, **international partners** have had to step in to provide assistance. Two key institutional arrangements that have brought together the Nepalese government and external actors in the absence of approved national structures and policies for DRM are: [i] the **Nepal Risk Reduction Consortium (NRRC)**, and [ii] the **Cluster Approach**.

The **Nepal Risk Reduction Consortium (NRRC)** was formed by ADB, IFRC, UNDP, UNISDR, OCHA and World Bank in May 2009 to back the government in developing a long-term Disaster Risk Reduction Action Plan, that builds on the **NSDRM** and supports the government in meeting its commitments under the Hyogo Framework for Action (HFA). The NRRC composed of a wide range of Nepalese government entities,

	Flagship	Leads/Coordination
01.	School and Hospital Safety	Min of Education/Min of Health/ADB/WHO
02.	Emergency Preparedness and Response Capacity	MoHA/Red Cross (formerly it was OCHA that co-led) .
03.	Flood Management in the Koshi River Basin	Min of Irrigation/World Bank
04.	Integrated Community Disaster Risk Management	Min of Local Development; Red Cross/IFRC
05.	Policy/Institutional Support for Disaster Risk Management	MoHA/UNDP

international humanitarian and development agencies, as well as international financial institutions was intended to function until the establishment of a NDMA under the new National Disaster Act. Programmatically, the Consortium operates according to **five Flagship Priorities**, as noted above.

Decisions under NRRC are made through high-level Steering Committee under the chairmanship of the Home Secretary and UN Resident Coordinator on a quarterly basis. 15 Ministries and agencies like, ADB, AusAID, ECHO, IFRC, Japanese Embassy, UNDP, UNOCHA, UKAid, USAid, World Bank, and DPNet (civil society representative) constitute the NRRC Steering Committee.

Another joint arrangement between national and international representatives that has helped to prop up the government’s role in DRM is the **Inter- Agency Standing Committee’s (IASC) Cluster Approach**. While there is not yet any legislation to back the arrangement, different government ministries have identified themselves as focal points for the various Clusters. (see below)

Clusters and national/international cluster lead

Cluster	National lead	International lead
Food security	Min of Agriculture	FAO/WFP
Health	Min of Health	WHO
Nutrition	Min of Health	UNICEF
Water and sanitation	Min of Planning	UNICEF
Education	Min of Education	UNICEF/Save the Children
Protection	Dept of Women/NHRC	UNICEF/UNFPA
Shelter	Min of Urban Development	IFRC/Nepal Red Cross/UN-HABITAT
Camp coordination	Min of Urban Development	IOM
Logistics	MOHA/Min of Labour	WFP
Early recovery	Min of Urban Development	UNDP

**Local Level:** The Local Self Governance Act, 1998 has delegated the authority of resource mobilization to local government to address issues such as local infrastructure, development initiatives and risk reduction, as well as post-disaster response and relief efforts. However, the allocation of resources for implementation is limited. Based on the Local Self Governance Act the Local Disaster Risk Management Planning (LDRMP) Guideline of the Ministry of Local Development has been approved in 2011, with the aim to institutionalize disaster risk management at local level and to mainstream DRM principle in development plans. In the framework of some start-up projects **community based DRR committees** representing all the interest groups in the community have been established. Many of them register as community based organizations – CBOs – at District level. This enhances community accountability for the management of revolving relief funds and other DRR decisions, makes the committees less dependent on particular individuals, and allows them to access government assistance and to participate formally in local government DRR processes.



The **absence of locally elected representatives** for over 15 years has hindered local planning processes, particularly the participation of local populations. As a result, issues such as risk reduction and climate change adaptation have been overlooked, unplanned or have limited resource dedication. Local level development initiatives continue to be scattered and sparse with a lack of overall alignment to national strategy or standard.

At the **district level**, Disaster Preparedness and Response Plan Framework (DPRPs ) have been completed in 75 districts and get revision yearly before the monsoon. These plans outline key actions and responsibilities for district authorities in order to prepare for and respond to disaster.

#### Gaps

- CNDRC to be replaced by a **Disaster Management Council** with clear leadership **headed by the Prime Minister**.
- National level: Slow progress in in the area of **school and hospital safety** (Retrofitting; Flagship 1)
- NRRC: To identify concrete projects to build resilience instead of numerous uncoordinated Risk Assessments
- Locally elected representatives with legitimacy in communities
- Allocation of funds for DDCs, VDCs and communities to ensure adequate allocation of resources for risk reduction.
- Strengthening local level ownership of risk reduction and climate change adaptation through capacity building, skill enhancement, awareness and supportive tools/mechanisms for planning and implementation.

#### Risk Financing

As per the Natural Calamities Act 1982 the Government of Nepal has allocated resources for response and relief. During the last years through different departments, around 5% of the total annual budget have been directly/indirectly allocated to implement disaster risk reduction plans and activities at all administrative levels. Sector plans continue to incorporate disaster risk reduction and the National Planning Commission has been developing disaster risk management and climate change adaptation inclusive development plans. However, budget allocations for DRR/CRM remain scattered among different programs and projects without long-term strategy in place and are difficult to track. There is also a lag between policy and planning and resource allocation for implementation; for instance while the 10th three year plan prioritized DRR at the policy level, implementation and budget allocation did not begin until the 13th three year plan.

At the **local level**, while planning tools such as the LDRMP support communities in planning for DRM, budget allocation and implementation is limited. At municipal level, funds have been made available for warehousing and fire brigades. The Government is beginning to address this issue by directing local authorities to allocate 2-5% of total revenue for DRR activities. In addition, partners in the flagship programme (mainly flagship 2 and 4) are also allocating funding for disaster risk reduction. However, there is a need to ensure local government is aware of this directive and has the capacity to act upon it.

#### Risk Assessment

Multiple risk assessment processes have taken place, however, translating them into action remains a challenge.

A comprehensive Risk Assessment including detailed information on the different types of hazards, geographical areas, exposure, vulnerability and risks has been mandated by MoHA and conducted by ADPC in 2010. ([http://www.adpc.net/igo/category/ID276/doc/2013-b27lym-ADPC-NHRA\\_Report.pdf](http://www.adpc.net/igo/category/ID276/doc/2013-b27lym-ADPC-NHRA_Report.pdf))

**Japan International Cooperation Agency (JICA)** in collaboration with MoHA has carried out a **comprehensive earthquake risk assessment of the Kathmandu valley in 2002. Multi-hazard maps for Kathmandu Valley** have been prepared with 5 municipalities completing an earthquake risk assessment. **Assessments for retrofitting** have been conducted for 265 schools in Kathmandu Valley and 60 hospitals have been assessed all over Nepal. **Participatory Vulnerability Risk Assessment (PVA)** has been conducted with support from various agencies. (e.g. Actionaid)

The NRRC Steering Committee has approved a three-phase process for a **nation-wide multi-hazard risk assessment** in 2015. The inception phase (stock-taking and preparation) has already begun. The objective

is to set baselines and to provide data for the Government to lead a debate on priorities, sequencing, policy and programme development.

**Gaps:**

- Multi-hazard risk assessment and maps to be prepared at national, regional and local level and updated regularly
- Technical capacity of local authorities to conduct risk assessment and analysis to be strengthened

### **Monitoring of hazards/ Early Warning**

**A network for Earthquake Monitoring Nepal** with 21 seismological stations has been established. With this system in place, earthquake of magnitude 4 and above are monitored with information displayed on the NEOCs public website and the National Seismological Centre webpage. <http://seismonepal.gov.np>

**Flood Monitoring: Real time information on rainfall** is available from over 25 hydrological stations and information on temperature, sedimentation, rainfall, and water levels in rivers from more than 50 stations are being displayed for 24 hours via webpage <http://www.hydrology.gov.np>

While monitoring systems have been established for flood and earthquake monitoring, it is important to expand these systems to address other hazards such as **fire, drought and landslide hazards**. (Information on recent landslides can be found on the webpage of ICIMOD; <http://www.icimod.org> )

There is a need to strengthen capacity to operate the existing monitoring systems and transmit the information to vulnerable communities for action. It is also important that communities have the tools and capacity to monitor and report disasters; for this, a rational and reliable data system at the community level is required. Indigenous knowledge systems related to DRM/CRM should be explored and reflected in data collection and sharing systems.

An **Early Warning Strategic Action Plan**, as a guiding document for development and sustainability of effective early warning systems, including institutionalization, is currently under approval process.

**Gaps**

- Early warning processes also require strengthening, particularly in the coordination and communication protocols amongst government, national and local stakeholders and communities.
- Institutionalization of EWS with regard to maintenance of equipment and focal point commitment

### **Risk Knowledge**

Risk information and knowledge management is available on regional platform of SAARC, the **Disaster Management Centre (SDMC)**. The mission of SDMC is to support the eight member states by providing policy advice and facilitating capacity building, organizing expert meetings and developing strategies and road maps.

However, for Nepal the expertise of the **National Society of Earthquake Technology (NSET)** and its network of engineers, geologists and scientists plays crucial role. NSET was founded by professionals in 1993 under the impression of the devastating Udaypur earthquake (1988) with the vision "Earthquake Safe Communities in Nepal by 2020", i.e. ensuring earthquake safety in the hazards prone urban as well as rural societies of Nepal. NSET seeks to make builders and citizens aware of affordable construction techniques that can significantly reduce seismic risk mainly targeting the constructors of the 80 % of new buildings in Nepal that are built informally, without engineering expertise. The organisation strives to use catchy means to demonstrate technical information, such as using a shaking table that shows the effects of an earthquake on scale models of two buildings, one built using traditional methods and the other incorporating earthquake engineering. This demonstration has been given to builders, masons, engineers, policy makers and health and disaster response personnel in Nepal and in the region (e.g. Pakistan). NSET is also involved in project implementation, e.g. the retrofitting of schools and other buildings in and runs earthquake drills for organisations such as hospitals.

There have been positive steps in **promoting disaster risk reduction in the school environment**. There are initiatives to gradually incorporate DRM related contents in school, university and other training curricula (e.g. Nepal army and police courses), mainly at secondary and university level (incorporation into

university programs such as engineering, geology and glaciology). School disaster preparedness programme is being implemented in some schools. School level disaster preparedness plans have been prepared and combined DRR/WASH training has been provided, e.g. as a part of flagship 1. However, there remains limited progress in ensuring country-wide and school wide (public and private) commitment.

#### Gaps

- Ensure country-wide and school wide (public and private) commitment to incorporate DRM related contents in school, university and other training curricula
- Integrate DRR into WASH training at schools
- Preparedness: All schools throughout the country must have at least one disaster drill each year.

### Disaster Risk Management

In the absence of an endorsed **Disaster Management Act (DMA)** there are a number of initiatives ongoing in the field of DRR, however, these efforts are fragmented and a well-structured and sustainable nation-wide approach is still missing. In particular at local level there are a lot of gaps and there is no instrument for the mainstreaming of DRM into development sectors.

In this situation, **UNDP** in close collaboration with international donors has been trying for years to push the DRM agenda forward by supporting the Government of Nepal in this specific topic. In 2008 UNDP has developed with the support of NSET the **National Strategy for Disaster Risk Management (NSDRM)**, (approved in 2011). Besides detailed suggestions for appropriate Institutional DRM Structures at all levels from national to community, the NSDRM also includes detailed, sector specific **guidance for the mainstreaming of DRM into sectorial strategies**.

In addition to the five **flagships** operated by the NRRC (see table page 11), efforts of the Government to implement the NSDRM have been supported by the **Comprehensive Disaster Management Programme (CDRMP)** (see table below). The **United Nations Development Assistance Framework for Nepal (UNDAF) 2013-2017** also includes the topic DRR under Component II Protecting development gains/ Outcome 7: *People living in areas vulnerable to climate change and disaster benefit from improved risk management and are more resilient to hazard-related shocks. This outcome is closely linked with Flagship 2.*

#### Comprehensive Disaster Management Programme (CDRMP)

Duration: January 2011- December 2015; Budget USD 16,5 Mio.; donors: BCPR, DFID, ECHO, UNDP, WB and UNISDR

Key programme activity areas are addressing the following topics:

- 1) Institutional & Legislative Systems (ILS) for DRM, National Building Code (NBC) and Risk Sensitive Land Use Planning (RSLUP)
- 2) Strategic Linkages with other Sectors and DRM mainstreaming (pilot: mainstreaming DRM/CRM into the local development plans of 3 districts (Dadeldhura, Nawalparasi and Saptari)
- 3) Climate Risk Management (CRM)
- 4) Community Based Disaster Risk Management (CBDRM) (aimed at covering 1000 VDCs/municipalities)
- 5) Emergency Preparedness and Response (EPR)
- 6) Early Recovery (ER)

### Risk Transfer

At the municipal level, in 58 municipalities a crops and livestock insurance system has been established by MoAD.



Destroyed houses with mud-bonded stone construction



Typical mud-bonded stone wall broken up in the centre

## 7. Lessons learned from earthquakes in 2015 and areas of intervention

### Shortcomings and major needs after the earthquakes 2015

**Houses destroyed:** Figures from NEOC (28/06/15) estimate that within the 14 most affected districts **539,000 houses** are destroyed (must be demolished) and **162,000 are damaged** (can be repaired) representing 44% and 13% of total houses respectively. An estimated 2.4 million people have lost their homes. About 26% of the damaged houses belong to women-headed households and 41% to Dalits and members of indigenous communities. The Shelter and Settlements Vulnerability Assessment conducted by REACH on behalf of the Shelter Cluster after the earthquakes indicated that mud-bonded brick or stone houses that are very common in the affected region were the most susceptible to earthquake damage as compared to cement-bounded brick and stone construction with RCC roof. (p. 28 ff) Prior to the earthquakes for instance in Sindhupalchowk 92% of the households lived in this type of construction.

**A total of 462 health facilities, the vast majority of which were public, were completely destroyed, while 765 were partially damaged.** 84% of the destroyed facilities are in the 14 most affected districts; Gorkha, Sindhupalchowk and Nuwakot experienced the highest number of destroyed health facilities. (PDNA 10/06/2015). Data indicate that over **40% of schools and 50% of classrooms have been affected**. 36,000 classrooms have been destroyed while around 17,000 additional classrooms have been damaged. (Education Cluster 23/06/2015)

According to ICIMOD in the 14 most affected districts, the earthquake has devastated the **livelihoods** of 5.4 million people. About 135,200 tonnes of foodstuff, 16,399 large livestock, 36,819 small livestock, and 460,762 poultry animals have been lost and more animals injured and sick. Production of animal products has been reduced due to stress syndromes, lack of feed and deteriorated health conditions brought by the earthquake's impact (NeKSAP/Food Security).

#### Gender Equality and Social Inclusion (Source: PDNA)

- *The **majority of the agricultural and informal sector workers are female** due to the low capital entry requirement of the informal sector and lack of livelihood options. The widespread loss of food stocks, potential loss in crop productivity and loss of livestock as well as small scale enterprises will likely cause a severe income shock for women who rely on this sector.*
- *A narrow asset base, burden of domestic work, limited access to economic resources combined with the lack of alternate livelihoods also mean **that recovery for women may take longer than for men who have more livelihood options**. Dalits and other marginalized groups, and people living in remote geographical regions who are already deprived of access to social services, will face similar challenges.*
- ***Women, Dalits and some ethnic groups have limited ownership of land, which could hinder their participation in the housing recovery programme and the benefits accruing from them.***
- *The **destruction of water supply and sanitation facilities** will have a direct negative impact on women and girls as they will now have to fetch water from greater distance.*
- *For vulnerable families, the loss of assets combined with the loss of family protection, and desperation for alternate livelihoods could have **disastrous consequences on women, girls and children** who may face heightened risk of sexual and gender-based violence, human trafficking, child marriage, and child labour.*



## Post Earthquake Assessments/ Lessons Learned

Almost four months after the event, there are a multitude of Sitreps and guidance papers, but comprehensive Post Earthquake Assessments including Lessons Learned for agencies that are planning to implement recovery projects with a BBB approach are rare.

- ACAPS: **Lessons learned for Nepal earthquake response** (27 April 2015, 2 pages) ([www.alnap.org/resource/20123.aspx](http://www.alnap.org/resource/20123.aspx))

The paper with a short list of lessons learned for the 'quick reader' was developed immediately after the earthquake and was intended as a first guidance for humanitarian actors in the response of the Nepal earthquake, but it includes also some points that can be useful in a later stage. The lessons learned are the result of *the analysis of main findings and lessons from evaluations of past earthquakes, with similar characteristics and features of Nepal.*

- ALNAP: Nepal Earthquake Response: **Lessons for operational agencies** (Sanderson, David and Ramalingam, Ben, 2015, 30 pages)

The paper of ALNAP/ODI seems to have been written shortly after the first earthquake in April 2015: It provides 17 generic lessons drawn from the experience of previous comparable disasters and is not specific for the particular situation in Nepal. The focus is clearly on urban situations comparable to the paper "Lessons from Kathmandu valley". However, it includes a list of interesting and useful links to documents and Web-sites for each lesson. (for more details see annex 9)

- **Post Disaster Needs Assessment PDNA** (June 2015; Executive Summary, 18 pages)

Following a methodology jointly developed by the EU, WB and the UN, the PDNA provides an estimation of the total amount of disaster effects (damages and losses) of the earthquakes in 2015 which served as a base for the Government to mobilize financial resources at the donor conference on 25 June and to develop a large-scale Recovery Programme of the Government. As the PDNA aims at promoting the principles of BBB in recovery and reconstruction it contains a number of valuable comments on resilience and DRR, as well as on the interlinkage between disaster impact and poverty, Gender equality and social inclusion, among others. (see also annex 10)

- ICIMOD: **The Strategic Framework for Resilient Livelihoods in Earthquake-Affected Areas of Nepal** (July 2015, 58 pages)

According to the authors the paper aims to complement the Post Disaster Need Assessment (PDNA) of the Government of Nepal by providing insights into the livelihood dimensions of the earthquake and its socioeconomic and livelihood impacts. It explores the strategic choices and options for developing resilient livelihoods post-earthquake, especially in mountain areas, and details a number of key elements of a strategy for livelihood recovery to inform the Government of Nepal's overall strategic plan. (see annex 11)

### Labour migration/ Remittances (Source: ICIMOD e.a.)

- *The **14 districts most affected by the earthquake** are estimated to have received **remittances** worth USD 1 billion in 2014. In the affected areas, 12–32% of the households have at least one member working as a migrant labourer (CBS 2012b).*
- ***Labour migration** is one of the **dominant sectors in Nepal's economy**. It is estimated that 2.2 million Nepalese are working abroad in the Gulf States and Malaysia, and there is an even greater, but unknown, number of migrant workers in India (IOM 2015). On average, **one recipient household** receives **NPR 80,000 (USD 800) annually**, or 31% of total household income (CBS 2011).*
- *In the case of a disaster remittances may also be used for recovery and reconstruction*
- *Labour migration has also affected the **ability of villagers to recover** in the immediate aftermath of the earthquake. The 14 worst-affected districts have a particularly **high absentee population**, and many villages have a preponderance of old people, women, and children, with few young able-bodied men, which means that due to **male out-migration** women will take on a larger responsibility of rebuilding sectors like agriculture and livestock.*
- *The earthquake has had a **substantial impact on migration**, both through overseas workers returning to help their families and a reduction in the number leaving. Following the earthquake, more than 125,000 Nepali migrant workers are thought to have returned home, ... (Kathmandu Post 2015a) to take care of their family members and rebuild houses. However, some sources estimate that **20–25% fewer workers departed in May 2015** and that migration numbers will stay at this level for some months before gradually increasing again.*

**Natural Resilience** (Lessons from a disaster zone; Peter Crawford 24 July 2015 on <https://www.devex.com> )

Based on his experience after the earthquake the author claims that *Nepalese are highly resilient*, firstly because they try to cope with the disaster without expecting anyone to help them and secondly because **a great deal of spontaneous response and recovery has and is taking place in Nepal despite the formal aid effort.** *The sheer range of people involved - from doctors and dentists spontaneously running health camps, motorcycle clubs relocating as volunteers to remote districts, local radio presenters acting as real-time response coordinators when "official" services went down, to mass clean-up campaigns - is remarkable.*

His explanation is, that *Nepalese show such high levels of resilience because of the constraints under which they live. Nepal is landlocked and inaccessible, has recently experienced civil war, has no legitimately elected government and its state officials rarely leave the capital. As a result the population, particularly those affected by the earthquake, does not expect government help.*

*And he is asking the question: When they are already getting on with it so well themselves, **what can we add?***

**Actual stage/ challenges ahead** (Main sources: Weekly Situation Update 07.08.2015 NEAU; IOM: Success and Failure of Nepalese vernacular stone and mud houses, Shelter Cluster Meeting, 05.08.2015)

- The Government has declared that the emergency relief phase is over and that the **recovery phase** started on 22 June. The recovery phase is guided by the results of the PDNA and accompanying International conference on Nepal's reconstruction on 25 June, during which the International pledged two-thirds to the USD 6.6 Billion appeal by the Government.
- The World Bank approved two credits in the total amount of 300 million USD for Earthquake recovery, including a 200 million housing reconstruction credit to provide **grants to rebuild about 55'000 houses** for the poor in rural areas. NSET is developing low-cost basic unit house types. (annex 6)
- While the response to earthquake-affected populations remains the top priority, the **need for winterisation** has been highlighted by humanitarian agencies as many of those who lost their houses will be unable to rebuild shelters for winter and temporary shelter remain inadequate. About 150'000 people live in areas where the average January temperature is 5 C or below.
- Recent more in-depth **assessments on damaged and collapsed mud-bonded brick and stone vernacular houses**, such as the review of IOM (Dave Hodgkin) have revealed that the performance of the building during the earthquake depends much more on the **quality of the workmanship** and the appropriate construction details rather than on the building material. Some 40-year-old houses survived the earthquake thanks to construction elements such as strong banding, frequent tie-stones and corner stones, rectangular rather than round stones, sparse use of mud mortar and reinforced gable walls. (see pictures below and annex 7)
- Anecdotal information indicates that beneficiaries want information or assistance for safer reconstruction but it was also implied that the **lack of this information would not prevent rebuilding**
- *According to a 30 July publication, the April and May earthquakes did not release the accumulated stress on the fault edges, although as a result, the Kathmandu bedrock shifted 1.3 m south and upwards by 50 cm. If the unruptured region ruptures in a single earthquake it could exceed Magnitude 8; thus the 2015 earthquake was not yet the great earthquake anticipated west of Kathmandu.*



Vernacular stone house with appropriate construction details that survived the earthquake



Poorly constructed stone house in the same village in Dolakha district (pictures: Dave Hodgkin, IOM)

*While it is not possible to predict the next major earthquake, experts recommend that the earthquake-affected region is built back better, and that settlements throughout western Nepal are retrofitted.*  
(Nature Geoscience, 12.08.2015)

- The government is supposed to develop a **large-scale recovery programme** on the basis of the PDNA results, however reportedly the authorities are not intending to start recovery before the end of monsoon and the subsequent religious holidays, i.e. in November.
- On 13 August the Government has appointed Govinda Raj Pokharel from the National Planning Commission, who has also led the PDNA team, the chief executive of the **National Reconstruction Authority** under the chairmanship of prime minister. The reconstruction ordinance is giving extensive power to the NRA; the tenure of the authority will be five years.

### Activities and geographical focus of Swiss NGOs

The five Swiss NGOs Caritas (CaCH), Helvetas, Solidar, Swiss Red Cross (SRC) and Terre des hommes (Tdh) have started in a first phase immediately after the earthquake to provide emergency relief to the affected population; in a second phase corrugated sheeting has been provided to families whose houses had lost their roofs. Temporary Learning Centres made of bamboo and corrugated iron, Temporary health posts and gender-segregated latrines were erected in dozens of VDCs.

The **Swiss Solidarity** has collected 32 Mio. CHF in total to support the Swiss NGOs; out of this amount 7 Mio. or 20 % have been spent during the emergency relief phase and 25 Mio. will be allocated to recovery and rehabilitation projects.

While the recovery project of CaCH will concentrate on the Education sector (Construction of 50 permanent schools), TdH and partly SRC will focus on the Health sector, Solidar on Housing and Helvetas on WASH. SRC will work with an integrated approach Shelter/Health/WASH/ Livelihood.

Based on good practice in **Build Back Better** gained in other countries such as Pakistan and Haiti (SDC's Competence Centre for Reconstruction (CCR) in Port-au-Prince) Helvetas and Solidar, as well as SRC will be engaged in trainings to strengthen the capacities of masons and homeowners to build affordable earthquake-resistant constructions. **Geographically** the main focus of Helvetas, Caritas and Solidar will be on 8 VDCs in Sindhupalchowk; Helvetas will also work in Gorkha, Lalitpur, Kavrepalanchowk, TdH will concentrate on 7 VDCs in Kavrepalanchowk, and SRC will be active in Dolakha, Sindhuli and Ramechhap. (see table below)

Recovery projects of Swiss NGOs

Agency	Thematic focus recovery/ response	Geographical focus	Partner
<b>Caritas Switzerland</b>	<b>Education</b> /Construction of 50 Schools+WASH (Helvetas)	<b>Sindhupalchowk</b> (8 VDCs)	MoE; local NGO
<b>Helvetas</b>	<b>WASH</b> component in Shelter and Education Sectors/ Awareness Building/ <b>Capacity Building BBB</b> / Shelter and Education Sectors <b>Livelihood</b> (Micro-enterprises)	<b>Sindhupalchowk</b> (8 VDCs) <b>Gorkha, Lalitpur, Kavrepalanchowk</b>	(Employment Fund/SDC),
<b>Solidar</b>	<b>Shelter</b> /Individual houses+WASH, BBB training for individual houses, livelihood (with Helvetas)	<b>Sindhupalchowk</b> (8 VDCs)	DUDBC; 4 Building types NSET
<b>Swiss Red Cross</b>	Integrated approach Shelter/Health/WASH/ Livelihood Health posts	<b>Dolakha</b> (Sindhuli, Ramechhap)	BBB Training: (CTEVT, Jiri)
<b>Tdh</b>	<b>Health</b> : Health posts, Health and Child Protection Systems strengthening	<b>Kavrepalanchowk</b> (17 VDCs)	MoHP; KIRDARC

### **Areas of intervention of other actors: SDC (Source: 3W e.a.)**

During the 40 days of emergency relief phase, Swiss Humanitarian Aid of SDC mobilised a total of 70 Swiss Humanitarian Aid Unit specialists. On site, the experts supported by personnel from the Swiss embassy and the SDC cooperation office in Nepal distributed more than 200 tonnes of relief supplies to 40'000 families. Another priority was providing medical care for mothers and children in Gorkha.

For the months ahead, the SDC will strengthen **local skills in the construction of earthquake-resistant buildings**. More specifically, it will offer special training courses for Nepalese bricklayers and carpenters based on positive experience gained in Haiti and Pakistan.

The SDC cooperation office in Kathmandu will reallocate part of its budget (CHF 20 million) for reconstruction work, while taking steps to ensure that highly vulnerable groups (women, children, ethnic minorities) are fully involved in the projects. Three Swiss experts are currently assisting the Nepalese government and a coalition of donor countries in drafting a key document setting out Nepal's critical reconstruction priorities. Lastly, the SDC is supporting a psychosocial counselling centre in its efforts to treat victims traumatised by the earthquake. The centre is located east of Kathmandu, in a region where Swiss cooperation has been active since the 1960s. DRR is integrated in the Swiss Cooperation Strategy 2013-17 as one of the guiding principles of the Programme.

### **Other donors**

As of 9 August the Flash Appeal of UN (total budget requested: USD 422 million) was funded by 51%. Additional to the USD 213.5 Million received for the appeal, Humanitarian contributions in the amount of USD 225 Mio. were provided in-kind and on bilateral basis outside of the appeal, thus summing up to USD 438.5 million. **Main donors** to the appeal contain the US, Norway, Canada, UK and Japan. Hundreds of organisations are involved in projects; the most important ones include UNICEF, WHO, UNHCR, Plan International, NRCS, Caritas Nepal, World Vision, Oxfam, Save the Children (see 3W, updated for the last time on 14 July; Operational Presence Map see Annex 13)

## **8. Recommendations for action**

The recovery and reconstruction phase is a critical opportunity not merely to return to the previous status quo, but to **Build Back Better** or Safer, including through integrating DRR into development measures, thus contributing to an increased resilience of the communities and the country. *Enhancing disaster preparedness for effective response and to Build Back Better in recovery, rehabilitation and reconstruction* is also **one of the four Priorities** of the new **Sendai Framework for Disaster Risk Reduction 2015-2030**.

### **Actions for "Build Back Better" should include:**

- a) Adopting **specific public policies in the field of DRM** in order to mitigate and minimize future losses, including through development measures such as land use planning and building standards improvement, and establishing related coordination and funding mechanisms.
- b) **Strengthening community resilience**, incorporating DRR in recovery, rehabilitation and reconstruction efforts and undertaking effective and drastic measures including land use planning and structural measures to prevent disasters in the future.
- c) **Learning from past disasters**, sharing the lessons learned and utilizing them to strengthen the resilience of the affected communities as well as other areas facing similar disaster risks.

Recovery phase is also an opportunity to increase **Gender Equality and Social Inclusion**, i.e. to empower women and disadvantaged and discriminated groups so that they are able to improve their status and exercise their human rights.

### **Integration of DRR into recovery project**

The **recommendations below** on how to integrate DRR into future activities have been developed and discussed with the participants of the joint Workshop in Kathmandu on 23 July 2015. (Participants: representatives of CaCH, Helvetas, Solidar, SRC, Tdh and SDC/HA) They are taking into account the particular context of the 2015 Earthquakes 2015 in Nepal, the already existing partnerships between Swiss NGOs and the focus of the planned recovery projects. At the time of the workshop some agencies had already started to integrate some of the suggested measures in the planning of their recovery projects.



- 1) **Address-** with the support of the Swiss Embassy/SDC and in alliance with UN and other Donors the **DRM agenda** in the **political Dialogue with the Government** and **advocate** for the endorsement of the drafted policies and implementation arrangements for a systematic DRM at all levels, namely:
  - **Disaster Management Act (DMA)**
  - **Building National Plan of Action** to replace the Building Act dating from 1993
  - **Land use mapping**, including regulations for relocation from risk zones
  - **Early Warning Strategic Action Plan**
  - After the inception phase, swift implementation of the planned three-year process for a **nation-wide multi-hazard risk assessment**
- 2) In the absence of an endorsed DMA strengthen **Coordination** with **existing DRM structures**, such as the NRRC, the DRM division of **Ministry of Home Affairs (MoHA)**, the CMDRM focal point of UNDP and National Reconstruction Authority; foster **Alignment** with existing initiatives, in particular the NRRC flagships.
- 3) Use existing DRM/ BBB knowledge, capacities and tools, such as the numerous Guidelines of the Technical Working Groups of the **UN-Shelter Cluster**, the Earthquake-resistant design of individual housing developed by **NSET** and the type design for Health facilities developed and promoted by MoH.
- 4) **Strengthen “Swiss Position” by developing a comprehensive “Swiss” package:** If the Swiss NGOs in Nepal join forces they will be in a stronger position in the dialogue with government while advocacy for DRM, inclusion of vulnerable groups, minimal standards etc., as well as in possible negotiations with Swiss Solidarity.
  - Arrange meetings and workshops on regular basis to exchange information/ experience in common geographic/thematic areas; develop common positions e.g. on mainstreaming of DRR/BBB into Recovery projects. The regular exchange meetings organized by the Swiss NGOs during the Hayan recovery phase 2014 in the Philippines can be considered as a good practice in this regard.
  - Technical inputs DRR: A next DRR workshop could be arranged on the occasion of the possible visit of the SDC DRR Advisors from Bangkok and Switzerland to Kathmandu planned for trimester IV.
  - Clarify roles and areas of intervention with Swiss Embassy/SDC who has been providing a platform for the coordination between the Swiss NGOs during the first months after the earthquake
- 5) **Shelter:** To ensure houses are ‘built back better’, **serious vulnerabilities in construction practices** and enforcement of building codes need to be addressed through training, information and outreach. (As already planned by SRC, Solidar, Helvetas/SDC) Coordinate and exchange experience with other stakeholders active in this area, e.g. NSET and SDC with ample knowledge on BBB training in Pakistan and the Competence Centre for Reconstruction (CCR) in Haiti. Trainings are also planned in the framework of the Government programme grant for the reconstruction of 55'000 homes funded by WB. In order to achieve a sustainable change of behaviour of the target groups it will also be important to include a comprehensive **concept of DRR/ multi-risk approach** into **BBS- Training and manuals**.
- 6) **Reconstruction projects in education and health sector:** Basically the structural engineer contracted by the agency will ensure the earthquake resistance of construction design. In addition it is advisable:
  - In the absence of endorsed land-mapping/ multi-hazard mapping in Nepal: have the **proneness of the construction site to different types of risks** checked by specialists: a hydrologist for water-induced hazard (flooding) and a geologist for land movement hazards (landslides, rock fall)
  - Have the possible effects on the building of the **seismic interaction between soil and structure** checked by a specialist.

Complete hardware by **soft component:**

- **Strengthen the** disaster awareness and preparedness in schools and hospitals
- **Integrate DRR/CC-component** in **WASH/ Hygiene sensitization campaigns** in order to strengthen the resilience of communities to water induced disasters (compare characteristic 8 of flagship 4)

- 7) Include **CBDRR-/ DRR Committee -component and/or DRR Capacity- Building for Local Authorities** into project, taking into account the existing coping mechanism and indigenous knowledge. In the framework of flagship 4 the following components of minimum characteristics of a resilient community have been defined (see Flagship 4 Handbook):
- Organisational base at Village Development Committee, ward and community level
  - Access to DRR information
  - Multi-hazard and capacity assessments
  - Community preparedness and response teams
  - DRR management plan at Village Development Committee and municipal level
  - DRR funds
  - Access to community managed DRR resources
  - Local level risk reduction measures
  - Community based early warning systems
- 8) **Livelihood projects** should include **systematic DRR mainstreaming, as integrated in the** Livelihood Strategy of ICIMOD, in order to avoid the building of new risks (see annexes 11 and 14). The communities have to be aware of the characteristics and the functioning of their physical environment and environment, the potential risk associated with this spaces and the human interventions that affect them. Agricultural production should include sustainable environmental practises (soil and water conservation, forest and biodiversity protection). **Women's dominance in the agricultural and informal sector** means that they will play a critical role in the recovery and rebuilding process if supported appropriately.
- 9) Post-disaster recovery will be more effective and sustainable if **gender equality** and **social inclusion** are acknowledged as one of the key guiding principles of implementation. Women and marginalized groups have unique capacities to drive resilience building of communities, given the right support. Equitable economic growth can lead them out of their disadvantaged conditions, increase resilience and lead to higher rates of economic growth. (PDNA) Attention should be paid to the fact that **women, Dalits and some ethnic groups have limited ownership of land**, which could **hinder their participation in the housing recovery programme** and the benefits accruing from them.

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## Annexes

- Annex 1: Abbreviations and acronyms
- Annex 2: Hazard and risk maps repository/ links
- Annex 3: Commented list of Reference Documents, web-sites
- Annex 4: Disaster Trends
- Annex 5: DRM Structure national and local level
- Annex 6: Standard design Shelter NSET
- Annex 7: Flyer CH NGOs/ SDC
- Annex 8: Type design Health/ MoHP
- Annex 9: Recommendations ALNAP
- Annex 10: Recommendations PDNA
- Annex 11: Recommendations ICIMOD (sustainable livelihood)
- Annex 12: Map of districts with geographical focus of Swiss NGOs: Maps Sindhupalchok, Gorkha, Dolakha; Kabhrepalanchok
- Annex 13: Operational Presence Actors
- Annex 14: Generic Indicators CH NGO DRR Platform (Annex A of Indicator Toolbox)
- Annex 15: Gender Checklist: Women as Key Actors in Recovery (SDC)